

PROFILING CALIFORNIA INDUSTRIES

A Guide to Using Industry Data



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October 2002

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I. Introduction

Economic development professionals are regular users of industry data, even though their uses of such information can vary widely. It may be to identify leading and lagging industries within a region, or the key industry clusters. Industry data may also be needed to provide background information for meetings with prospective investors, or to better understand the existing industries within a community. Whatever the use, there is an important and ongoing need for accurate and current industry information in economic development.

Locating the most appropriate information can be a difficult and time-consuming task. And without an understanding of the sources and characteristics of such data there is the risk of presenting an incomplete or inaccurate profile of an industry. The Economic Strategy and Research (ESR) group in the California Technology Trade and Commerce Agency regularly responds to a variety of industry information requests. ESR prepared this guide to assist economic development professionals in obtaining industry data more quickly and easily, particularly from the economic data links located in the ESR Web pages. (Enter Web address <http://commerce.ca.gov> and select California's Economy and Economic Data from the left column.)

II. Using This Guide

To illustrate how industry information can be quickly obtained and assembled, a brief profile of the communications equipment manufacturing industry group is presented. (An industry group frequently provides a more representative picture than a single industry.) The material then leads the reader through the process and data that were used to prepare the profile.

The guide begins by describing the industry definitions and classification systems used by data collection agencies. Next, the time period and geographic area to be used are discussed, since not all data are released at the same time or frequency, or for the same geographic areas. Finally, the available types of industry data are presented, such as: number of establishments and jobs, occupations employed, wage and salary levels, value of production and output, international trade and investment, and industry research and development.

To illustrate each topic presented, the communications equipment manufacturing profile is continually used as an example. As different data sources are identified, the available information for the communications equipment manufacturing industry group is provided, along with some interpretation of the data. Some of the limitations of available data sources are also discussed.

As a final note, it must be emphasized that an industry profile is not the same as an industry analysis. An analysis requires additional information and interpretation, and often the technical assistance of economists and/or industry experts. Data on the characteristics and trends for an industry do not necessarily indicate its current condition, or the competitive forces it faces. For example, such data will not identify important factors that may be affecting an industry. Such factors may include new competitors, existing inter-industry rivalries, the availability of substitute products, or the size and concentration of suppliers and purchasers.

III. A Quick Sample Profile

Figure III-1 on the next page contains a brief profile of the communications equipment manufacturing industry group. This profile is just an example of the many ways industry information can be summarized and presented. There are numerous issues that must be considered when profiling an industry. The following paragraphs present these issues.

Can the Industry Be Clearly Defined? Source agencies compile industry data based upon established industry classification systems. The use of general industry descriptions, such as technology or travel, may seem clear. However, the economic activities that can comprise such broad-based descriptions can vary widely, resulting in widely different pictures of the "industry."

Who Is the User of the Information? Different target audiences will have different information needs, and differing abilities to absorb and use the economic data presented. If the audience comprises a diverse group of users, it will be necessary to accommodate that diversity in the content, layout, and text of the profile.

Is the Time Period Important? Data series differ in the frequency and timing of their releases. For example, an industry census may provide extensive detail, but may be years old. Also, is the purpose of the profile to only provide the latest picture of the industry, or is some historical perspective also needed?

How Much Detail Is Required? An industry profile can be less than a page in length, and contain information on just a few key indicators such as employment, sales, and number of establishments. A profile can also be dozens of pages, with numerous tables, figures and maps. (For the communications equipment example provided here, a one-page overview was deemed sufficient to illustrate the process and data.)

What Specific Economic Measures Are Needed? There is a large amount of economic data published on industries; however, most users only need portions of the available data. Listed below are the major types of information that can be presented. In many cases, California data can also be compared to data for other states and the nation.

- Number, size, and geographic distribution of business establishments.
- Industry employment and its geographical distribution.
- Industry output.
- Worker wage and salary information.
- Occupational supply and demand in the industry.
- International trade and investment activity.
- Venture capital and research and development activity.
- Information on individual companies and products of the industry.

Figure III-1 Communications Equipment Manufacturing in California

Communications equipment manufacturing in California is a high-pay, high-technology industry group. It consists of the following three industries classified under the 1997 North American Industry Classification System (NAICS): telephone apparatus manufacturing (NAICS 334210); radio, TV broadcast, and wireless communication equipment manufacturing (NAICS 334220); and other communications equipment manufacturing (NAICS 334290). In the year 2000, there were 544 establishments in California employing more than 49,500 persons. The three industries in this group shipped about \$39.1 billion of products that year. Average annual pay in the industry group during 2000 was \$92,281, including bonuses, stock options, and other non-wage compensation. The industry group average pay was more than 230 percent of the all-industry statewide average pay.

More than 80 percent of the establishments are small businesses employing less than 100 employees. Ninety six percent are small businesses employing less than 500 persons. (This is the definition of small business used by the U.S. Small Business Administration).

Two of the industries have been stable or growing over the period from 1998 to 2000 (the latest data available). Employment in the telephone apparatus industry (NAICS 334210) declined from about 27,650 in 1998-99 to about 14,600 based on the NAICS data. That decline is primarily due to the increased usage of wireless cellular telephones and the recent retrenchment of the telecommunications industry. Corporate buyers may also have cut back on their purchases of data communications equipment, such as bridges, gateways and routers, as they waited for the uncertainties associated with the Y2K problem to be resolved.

The decline in NAICS 334210 is not reflected in the Standard Industrial Classification (SIC) based data. This situation may be the result of complexities and inconsistencies in the way companies have been classified by industry. For example, large communications equipment companies such as Cisco Systems may be placed in a computer-related industry (e.g., SIC 3577), instead of in a communications equipment industry, such as SIC 3661 (telephone and telegraph apparatus). Data discrepancies of this sort should be resolved over the next few years as most government agencies complete the transition to the new NAICS codes.

The communications equipment manufacturing industry group is distributed fairly equally between southern California (Los Angeles to San Diego area) and the San Francisco Bay Area. The following five counties account for about 75 percent of the establishments and 83 percent of the employment: Alameda, Los Angeles, Orange, San Diego, and Santa Clara. The following are the three industries in the group:

Telephone Apparatus Manufacturing, NAICS 334210. This industry includes 157 establishments employing about 14,600 persons, with an average pay of \$130,851. That average pay was more than three times the all-industry statewide average pay. Some of the largest companies are Cisco Systems (38,000 total employees), Siemens, Lucent Technologies, Octel Communications Corp., and Nortel Network.

Radio, TV Broadcast, and Wireless Communications Equipment Manufacturing, NAICS 334220. This industry includes 294 establishments employing almost 31,800 persons, with an average pay of \$74,942. Some of the largest companies are Boeing, Space Systems/Loral Inc., Lockheed Martin Management and Data Systems, Litton Guidance Control Systems Division, Hughes Electronics, and Ericsson Wireless Communications.

Other Communications Equipment Manufacturing, NAICS 334290. This industry includes 93 establishments employing about 3,160 persons, with an average pay of \$88,270. Some of the largest California firms in this industry produce traffic signal equipment, railroad signal equipment, intercoms, and burglar alarms. For example, Myers Custom Products, in Santa Fe Springs, is a major employer that has been manufacturing traffic control components for over 50 years.

IV. Defining Industries

Data collection agencies use established classification systems for defining and measuring all the industries in the economy. These systems were created to ensure that all users have the same understanding when they use an industry description. You may know what you mean when you say the “aerospace industry” or the “bread industry.” However, others may have a different idea regarding what constitutes those industries. The dictionary definition of “industry” – a distinct group of productive or profit-making enterprises – is too broad for statistical data collection and economic analysis.

The industry classifications that have been used for decades are from the Standard Industrial Classification (SIC) system. As a result, most historical data is classified under the SIC. Recently, data has begun to be classified under the North American Industrial Classification System (NAICS), which is also used by Canada and Mexico. Eventually, all new data will be classified under NAICS.

Both NAICS and the SIC system are based on establishments—generally a single, physical location at which economic activity occurs, such as a factory, store, farm, or mine. An establishment, for statistical purposes, is the smallest operating entity for which records are kept on the cost of resources (materials, labor, capital, etc.) used to produce outputs.

Defining an industry usually involves consulting the manual for an industry classification system. The next section provides an overview of the SIC system. The following section describes NAICS. Finally, some important data issues involving the current transition from SIC to NAICS are discussed. In some instances, the transition can complicate industry data collection and analysis.

The Standard Industrial Classification (SIC) System

The SIC coding system was developed in the 1930s, when manufacturing dominated the U.S. economy. Since that time there have been numerous revisions to the system. The 1987 SIC codes are the latest.

The SIC system uses 4-digit codes. Each 4-digit code designates an individual industry. A 3-digit code designates an industry group, which generally consists of related 4-digit industries. A 2-digit code designates a “major group,” which generally consists of related industry groups. A division, such as Manufacturing (Division D), consists of an aggregation of related 2-digit major groups.

The following is the link to the on-line 1987 SIC manual: [Standard Industrial Classification \(SIC\) System \(1987\)](http://www.census.gov/epcd/www/sic.html) [Link to: <http://www.census.gov/epcd/www/sic.html>] [Note: One may occasionally encounter data based upon the obsolete 1972 SIC codes.]

North American Industry Classification System (NAICS)

NAICS was developed, in part, because of increasing concerns about the ability of the SIC to account for rapid changes in the economy. This new system includes industries that reflect the enormous changes that have occurred with technology, and with the growth and diversification of services, in recent decades.

NAICS is the first industry classification system based on a single principle of aggregation, which is that producing units using similar production processes should be grouped together.

Establishments within a NAICS industry share a basic production process, and use similar technology. This supply-based (or production-oriented) economic concept is used, because an industry classification system is a framework for collecting information on both inputs and outputs.

NAICS organizes economic activities into 20 broad sectors, up from the 10 divisions of the SIC system. For example, Manufacturing is Division D in the SIC system, while the Manufacturing sector in NAICS is designated by the 2-digit codes 31-33.) Five of the NAICS sectors represent goods-producing industries, while 15 sectors represent services-producing industries.

NAICS uses a 6-digit coding system to identify individual industries. The first two digits of the code designate one of the 20 sectors. The third digit designates the sub-sector. The fourth digit designates the industry group. The fifth digit designates a NAICS industry, and the sixth digit a national industry that may not exist in all three countries (U.S., Canada, and Mexico).

The United States version of NAICS groups economic activity into 20 sectors, 96 sub-sectors, 311 industry groups, 459 NAICS industries (for which there is comparability among all three countries), and 1,170 U.S. industries. The first 700-plus pages of the 1997 NAICS manual for the United States provide a description of each industry with its corresponding code. Accordingly, the NAICS manual or website is the first reference to consult in defining an industry or industry grouping.

The following is the on-line link to the original NAICS manual published in 1997: [North American Industry Classification System \(NAICS, 1997\)](http://www.census.gov/epcd/www/naics.html). [Link to: <http://www.census.gov/epcd/www/naics.html>] The following is the link to the 2002 NAICS manual that contains revisions to the construction, wholesale trade, retail trade, and information sectors: [North American Industry Classification System \(NAICS, 2002\)](http://www.census.gov/epcd/naics02/). [Link to: <http://www.census.gov/epcd/naics02/>] (The U.S. Office of Management and Budget has stated that federal statistical data published for reference years on or after January 1, 2002, should be published using the 2002 NAICS U.S. codes.)

The Current Transition From SIC to NAICS

Many of the individual NAICS industries correspond directly to industries defined under the SIC system. However, most of the aggregate NAICS groupings do not correspond to SIC groupings. NAICS also includes some 350 new industries that are being separately recognized for the first time. Some of these industries reflect high-technology developments in the economy, while others recognize changes in the way business is done. If an "industry" being profiled is actually an aggregation of individual industries, that fact should be made clear in the profile.

In general, industry definitions should be based on NAICS, since that is the current and future industry classification system. However, that choice may require "bridging" between existing SIC-based data to the NAICS-based data, since a considerable amount of industry-related data is still only available based on the SIC codes.

Table IV-1 below provides an overview of the federal data agency timetables for the transition. (The California Employment Development Department (EDD) is currently in the process of converting to NAICS.)

Table IV-1, NAICS Conversion Timetables			
Agency*	Data Program	Data Period	Published
Census	County Business Patterns	1998	March 2000
Census	Annual Survey of Manufactures (ASM)	1998 [#]	June 2000
BLS	Covered Employment and Wages (CEW)	2001	Fall 2002
BLS	Current Employment Statistics (CES)	May 2003	June 2003
BEA	Gross State Product by Industry	2002	2004




* Census = U.S. Census Bureau, BLS = U.S. Bureau of Labor Statistics, BEA = U.S. Bureau of Economic Analysis.

The 1998 issue of ASM also includes NAICS-based industry data for 1997.




Two U.S. Census Bureau websites show the treatment of industries under the two classification systems: [1997 Bridge Between NAICS and SIC Codes](http://www.census.gov/epcd/ec97brdg/) [Link to: <http://www.census.gov/epcd/ec97brdg/>] and [1997 NAICS and 1987 SIC Correspondence Tables](http://www.census.gov/epcd/www/naicstab.htm). [Link to: www.census.gov/epcd/www/naicstab.htm]

The industry profiled in the previous section of this guide was Communications Equipment Manufacturing (NAICS 3342). Using this industry group as an example, the following Table IV-2 shows the bridge between this group under the 1997 NAICS and 1987 SIC codes for various 1997 U.S. Economic Census data:

Table IV-2
Comparison Between NAICS and SIC for Communications Equipment Manufacturing

NAICS	SIC	Description	Establishments	Value of shipments (\$1,000)	Paid employees	Annual payroll (\$1,000)
3342		Communications equipment mfg	2,312	81,841,446	293,910	13,616,207
33421		Telephone apparatus mfg	598	38,300,044	104,262	5,329,203
334210		Telephone apparatus mfg	598	38,300,044	104,262	5,329,203
<i>96% of</i>	3661	Telephone & telegraph apparatus (pt)	598	38,300,044	104,262	5,329,203
33422		Radio & TV broadcasting & wireless communications equipment mfg	1,217	39,308,114	164,461	7,371,880
334220		Radio & TV broadcasting & wireless communications equipment mfg	1,217	39,308,114	164,461	7,371,880
	3663	Radio & TV communications equipment	1,091	37,042,241	148,156	6,765,352
<i>6% of</i>	3679	Electronic components, n.e.c. (pt)	126	2,265,873	16,305	606,528
33429		Other communications equipment mfg	497	4,233,288	25,187	915,124
334290		Other communications equipment mfg	497	4,233,288	25,187	915,124
	3669	Communications equipment, n.e.c.	497	4,233,288	25,187	915,124

Symbol definitions:

 (Bridge complete.)	Comparable	NAICS derivable from SIC data.
 (Drawbridge slightly open.)	Almost comparable	Sales or receipts from SIC are within 3% of NAICS sales or receipts.
 (Drawbridge open.)	Not comparable	NAICS sales or receipts cannot be estimated within 3% from SIC data.

Source: <http://www.census.gov/epcd/ec97brdg/E97B1334.HTM#3342>

The preceding table shows that the NAICS 3342 industry group consists of the following three industries:

- 33421, *Telephone apparatus manufacturing*, which at the national level represents 96% of the SIC 3661 value of shipments (since telegraph apparatus is no longer included).
- 33422, *Radio & TV broadcasting & wireless communications equipment manufacturing*, which is 100% of SIC 3663 and 6% of SIC 3679.
- 33429, *Other communications equipment manufacturing*, which is equivalent to SIC 3669.

(Each of these three industries is assigned a 6-digit U.S. industry NAICS code by appending a zero to the 5-digit NAICS industry code.)

V. Available Industry Measures

A basic goal of an industry profile should be to identify the size, structure and geographic distribution of an industry. The next three paragraphs discuss these important concepts. The remaining material in this section discusses the available industry measures in detail, and relates them to the communications equipment manufacturing industry example.

Size. There are numerous measures of the "size" of an industry. The most commonly used size measures include the total number of establishments, employment, payroll, and sales or other industry receipts. The volume of exports is also a measure of the size of an industry in the international marketplace. By including data for a number of recent years, and using graphs and other figures, it is possible to see whether an industry is growing, stable or perhaps declining in size.

Structure. To provide more insight into an industry, it is possible to include data showing the number of establishments in various employment-size classes. For example, the number of small businesses in the industry compared with the number of large firms. If the "industry" being profiled is actually an aggregation of individual industries, then the count of establishments for each individual industry provides even more information on the structure of the aggregated industry. It is also possible to ascertain the occupational structure of the industry, such as percentages of engineers and other occupations in the industry.

Geographical Distribution. For site selection and other purposes, it is often necessary to know where an industry is located within California. The number of establishments and jobs in the various counties and metropolitan areas provide such information. In some industries, a few establishments may be very large, and therefore account for a high proportion of total industry jobs. In such a case, the geographical distribution of jobs may differ noticeably from the distribution of establishments.

Using geographical information system (GIS) software, maps can be prepared that illustrate how an industry is distributed throughout the state. Presenting data visually can make it much more clear and

useful. Maps are also helpful in highlighting importance differences among the industry data, such as the previously cited example of the distribution of jobs differing from the distribution of establishments.

The Importance of Time Periods

Economic data are usually published monthly or annually. However, there is a delay between when data are collected, processed, and published for use. In some instances, the delay is only a few weeks. In others, the delay may be a year or more. It is important to note the timing and frequency of the data being used, since data from different sources and time periods may need to be reconciled.

In addition to those general considerations, it is useful to determine in advance the industry profile that is desired. Is the latest data the most important? Or, is data needed for a specific month or year, or period of months or years. Time series data can help indicate whether an industry is growing, relatively stable, or potentially in decline.

Establishment, Employment, and Payroll

Employment, wages, payroll, and the number and size of establishment data provide measures of the size of an industry and its presence in California. The two major source agencies for such data are the U.S. Census Bureau and the California Employment Development Department (EDD). (The U.S. Bureau of Labor Statistics also produces extensive employment data, which is used by the Census Bureau and EDD.)

U.S. Census Bureau (County Business Patterns)

County Business Patterns (CBP) is an annual series published by the U.S. Census Bureau. It is a valuable source of industry information, since it provides statewide, county, and some sub-county data. Subject to disclosure restrictions for individual companies, the data for each industry include payroll, number of employees, total number of establishments, and number of establishments by employment-size class.

The series has been published annually since 1964, although the comparability of data over time can be affected by definitional changes in establishments, activity status, and industrial classifications. For 1998 and later years, the CBP presents its data using the new NAICS codes. Data for 1997 and earlier years are based on SIC codes.

CBP covers most of the country's economic activity. The basic data items are taken from comprehensive counts of all known single and multiple establishment companies. That information is further supplemented by annual Company Organization Surveys, as well as administrative records from the Internal Revenue Service, the Social Security Administration, and the Bureau of Labor Statistics.

Because the CBP data are tabulated from files containing the known "universe" of establishments, the data are not subject to sampling errors. (However, the data can be subject to some nonsampling errors.) CBP excludes data on self-employed individuals, employees of private households, railroad employees, agricultural production employees, and most government employees.

The following link provides an overview to County Business Patterns:

<http://www.census.gov/epcd/cbp/view/cbpview.html>

The Communications Equipment Manufacturing Example (NAICS 3342). Table V-1 presents CBP data for California in NAICS 3342. Between the years 1999 and 2000, employment for this industry group declined about 22 percent. The decline was concentrated in NAICS 334210, telephone apparatus manufacturing, where employment declined about 47 percent. That trend appears to be consistent with the increased usage of wireless cellular telephones, and the recent retrenchment of the telecommunications industry.

Table V-1. NAICS 3342 California Data from County Business Patterns

NAICS	NAICS Industry Title	Total Employees			Establishments		
		1998	1999	2000	1998	1999	2000
3342	Communications equipment mfg	63,565	63,687	49,553	556	543	544
334210	Telephone apparatus mfg	27,652	27,655	14,614	158	165	157
334220	Radio, TV broadcast & wireless comm. equip mfg	33,226	33,312	31,777	309	297	294
334290	Other communications equipment mfg	2,687	2,720	3,162	89	81	93

(See the following link to access the CBP reports for California:

<http://www.census.gov/prod/www/abs/cbptotal.html>)

According to the county-level data for California, six counties account for about 83 percent of the employees and 76 percent of the establishments in the NAICS 3342 industry group. (See Table V-2). It also appears that the industry is about evenly distributed between southern California (Los Angeles to San Diego area) and the San Francisco Bay Area.

The county data also show that more than three fourths of the 1999-2000 employment decline in NAICS 3342 occurred in Santa Clara County. Furthermore, the statewide data for NAICS 334210, the telephone apparatus manufacturing industry, shows that employment declined by 13,041 from 1999 to 2000. (See Table V-2). Although NAICS 334210 county-level data are not presented here, they would show that nearly four fifths of that decline occurred in Santa Clara County.

Table V-2. NAICS 3342 for Selected California Counties

County	Total Employees			Total Establishments		
	1999	2000	'00 %	1999	2000	'00 %
California Statewide	63,687	49,553	100.0%	543	544	100.0%
Alameda	3978	2,623	5.3%	47	45	8.3%
Contra Costa	233	141	0.3%	7	5	0.9%
Los Angeles	12819	12,285	24.8%	96	102	18.8%
Orange	3097	3,561	7.2%	58	60	11.0%
San Diego	4767	4,141	8.4%	56	55	10.1%
Santa Clara	29,366	18,574	37.5%	149	146	26.8%
Total of Above Six Counties	54,260	41,325	83.4%	413	413	75.9%

Table V-3 shows size of establishment data for the year 2000, with the total count of establishments by employment-size class. As is frequently the case, all three industries are dominated by smaller businesses. There are 14 establishments statewide with 500 to 999 employees. And there are five large establishments that employ more than 1,000 employees each. (CBP also shows the five smaller size classes that comprise the 1-99 employee size class.)

The county-level data (not shown here) would locate all three of the large establishments of NAICS 334210 in Santa Clara County. And similar data for 1999 shows that there were four establishments in NAICS 334210 in Santa Clara County that employed 1,000 or more persons. This change in establishment information is consistent with the 1999-2000 decline in employment in the NAICS 334210 industry.

Table V-3. NAICS 3342 California Data by Employment-Size Class in 2000

NAICS	NAICS Industry Title	Total Estab.	Establishments by Employment-Size Class				
			1-99	100-249	250-499	500-999	1,000+
3342	Communications equipment mfg	544	442	60	23	14	5
334210	Telephone apparatus mfg	157	119	25	6	4	3
334220	Radio, TV broadcast & wireless comm. equip	294	238	30	14	10	2
334290	Other communications equipment mfg	93	85	5	3	-	-

California Employment Development Department (EDD) Data

The Labor Market Information Division (LMID) of EDD produces two key industry employment series: Covered Employment and Wages (CEW) and Current Employment Statistics (CES). This subsection discusses each of these data series, and the differences in the data produced by them. (In particular, it should be noted that the official employment estimates are from the CES program.) As of August 2002, all LMID data are being based on the 1987 SIC codes, where a 4-digit code designates an individual industry rather than an industry group.

Covered Employment and Wage Data (CEW or ES202). These data are derived from quarterly tax reports submitted to EDD. The data are from employers subject to state unemployment insurance (UI) laws, and from federal agencies subject to the Unemployment Compensation for Federal Employees program. EDD edits and processes the data, and forwards the information to the U.S. Bureau of Labor Statistics (BLS) in Washington, D.C.

For each establishment that reports ES202 data, EDD assigns an SIC code based on a description of the establishment's production activities, as provided by the employer on a questionnaire. To ensure high-quality data, EDD verifies and updates, as necessary, the SIC code and other information for all establishments on a 3-year cycle. If the production activity at an establishment changes over time, it is possible that an establishment's assigned SIC code could incorrectly reflect the actual production activities for two years or more.

According to LMID, the ES202 data are the most complete universe of monthly employment and quarterly wage information by 4-digit SIC industry at the national, state, Consolidated Metropolitan Statistical Area (CMSA), MSA, and county levels. The data include number of establishments, average monthly employment, annual payroll, and average annual pay. LMID also says that, "ES202 data are used by businesses and by public and private research organizations as one of the best sources of detailed employment and wage statistics for economic forecasting, industry and regional analysis, impact studies, and other uses." As of August 2002, annual average ES202 data are available at the LMID website for the years 1997 through 2000. (See <http://www.calmis.ca.gov/file/es202/cew-select.htm>.)

EDD Data Disclosure Restrictions

Government statistical agencies are required to protect the identity of individual employers who report CEW data. Accordingly, BLS and EDD will suppress (not publish) data if there are fewer than three establishments in an industry, or if a single employer makes up more than 80 percent of the industry employment. Data for a large state such as California will be published at the state level for most industries. However, for sub state areas such as counties there may be many industries for which the data will be suppressed to protect confidentiality. Similar disclosure restrictions exist for data from the Census Bureau, U.S. Department of Commerce, and other state and federal statistical agencies.

Table V-4 shows the ES202 data for communications equipment manufacturing in 2000.

Table V-4 Communications Equipment Manufacturing in 2000 (ES202 Data)

<i>SIC Code</i>	<i>Detailed Industry Title</i>	<i>Number of Establishments</i>	<i>Average Monthly Employment</i>	<i>Annual Payroll (\$1,000)</i>	<i>Average Annual Pay</i>
366	Communications Equipment	618	42,572	\$4,105,123	\$96,428
3661	Telephone and telegraph apparatus	170	18,651	\$2,149,333	\$115,237
3663	Radio & TV communications equipment	320	19,104	\$1,485,752	\$77,773
3669	Communications equipment, nec	128	4,817	\$470,038	\$97,584

Comparing CBP to ES202 Data. The County Business Patterns (CBP) data presented previously are significantly different from the ES202 data for communications equipment manufacturing. Part of this is due to the CBP being NAICS based and the ES202 being SIC based. Table III-2 showed the "bridge" between the 1997 NAICS codes and the 1987 SIC codes for communications equipment manufacturing. That comparison of the two code systems showed that some industries in the communications equipment manufacturing group were comparable, or almost comparable, while other industries were not comparable.

Another reason for the difference between CBP and ES202 data are the different methodologies and employer records used to create each of the data series. A look at Other Communications Equipment Manufacturing -- one of the "comparable" industries -- illustrates this situation. While NAICS 334290 is listed as being derivable from SIC 3669 data, the reality is that the CBP and the ES202 data for that industry differ by a fair margin. The NAICS-based data show 93 establishments and 3,162 employees in year 2000, while the SIC-Based data show 128 establishments and 4,817 jobs. Further discrepancies, and sometimes larger ones, can occur when working with county-level or time-series data.

An additional possible factor behind the different data is reporting by businesses. Companies responding to government requests for industry identification must identify the predominant activity of an establishment. That is not always an easy task, and reasonable people could come to different industry choices, particularly in the complex and rapidly changing technology industries. For example, under the 1987 SIC coding system some modern, high technology companies may have been classified in SIC 3577, computer peripheral equipment, nec (not elsewhere classified). Even as of mid-2002, some commercial business directories list Cisco Systems in SIC 3577, so it would not be counted as part of SIC 3661. However, companies like Cisco that produce Internet routers would today be classified in NAICS 334210, the approximate equivalent of SIC 3661.

The transition from SIC to NAICS coding, combined with the different data records and methodologies used by different sources agencies, present problems when profiling an industry. Users of the data must select one data source, and understand that another source may provide different industry values. It is hoped that occurrence of such data differences will diminish, as all governmental statistical agencies convert their data series to NAICS over the next few years.

Current Employment Statistics Program (CES). Data from the SIC-based CES program are the basis for EDD official estimates of employment by industry, average weekly and hourly earnings, and average weekly hours. The CES data are derived from a monthly employer sample survey of approximately 300,000 nonfarm establishments nationwide (and a proportionately smaller number of California establishments). While the ES202 data only include employment covered by

unemployment insurance programs, the CES program attempts to estimate all employment. Another difference involves the industry placement for agricultural services. In the ES202 data Agricultural Services (SICs 074, 075 and 078) are placed in the major industry group, "Agriculture, Forestry, and Fisheries." However in the CES estimates those SICs are included in the major industry group, "Services".

Current and historical CES estimates of employment by industry are updated monthly, and available at the LMID website. (<http://www.calmis.ca.gov/htmlfile/subject/indtable.htm>) The data can be downloaded as an Excel file.

Using communications equipment as an example (SIC 366), CES employment is somewhat higher than the ES202 number, since CES program attempts to estimate all industry employment (see Table V-5). The CES also has an additional year of data, 2001. However, unlike the ES202, there is no CES data at the 4-digit SIC industry level.

Table V-5. SIC 366 Industry Group Employment, CES Versus ES202 Data

SIC	SIC Industry Title	Total Employees			
		1998	1999	2000	2001
366	Communications equipment (CES data)	39,200	40,600	43,500	44,800
366	Communications equipment (CEW data)	37,846	40,105	42,572	--

The CES estimates can be expected to diverge over time from the ES202 data, because the CES estimates are derived from a sample. In contrast, the ES202 data constitute a near-census. To correct for such divergence, national and state industry CES estimates are benchmarked annually in March to the ES202 data. These final revisions to the statewide and local area numbers are made for the previous two years, based on payroll tax reports submitted to the State by California from employers covered by the unemployment insurance program.

For more information about the differences between ES202 and CES data, see the following link: <http://www.calmis.ca.gov/file/es202/CEW-About.htm>.

Average Industry Pay

CBP and ES202 provide annual payroll data that can be used to compute average annual pay for an industry. CBP defines total annual payroll to include all forms of compensation, such as salaries, wages, reported tips, commissions, bonuses, vacation allowances, sick-leave pay, employee contributions to qualified pension plans, and the value of taxable fringe benefits.

Table V-6 compares the average pay in the communications equipment manufacturing industry group to the average pay statewide for all industries.

Table V-6. Average Pay Data for NAICS 3342 Industries in 2000

NAICS	NAICS Industry Title	Payroll (\$1,000)	Total Employees	Average Pay	% of CA
--	All California industries	514,360,478	12,884,692	\$39,920	100%
3342	Communications equipment mfg	4,572,812	49,553	\$92,281	231%
334210	Telephone apparatus mfg	1,912,258	14,614	\$130,851	328%
334220	Radio, TV broadcast & wireless comm. equip mfg	2,381,443	31,777	\$74,942	188%
334290	Other communications equipment mfg	279,111	3,162	\$88,270	221%

Industry Output

There are three principal sources of industry output data: the Economic Census, the Annual Survey of Manufactures (ASM), and the gross state product data computed by the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce.

The U.S. Census Bureau conducts the Economic Census every five years, in years ending in the number 2 or 7. (The 1997 Censuses are the latest.) The Economic Census reports the total sales, shipments, receipts, revenue, or business done by establishments that are within the scope of each particular economic census. (The following Web link accesses the home page for all the 1997 Economic

Census: <http://www.census.gov/epcd/www/econ97.html>)

For the communications equipment manufacturing industry group (NAICS 3342), the 1997 Economic Census for manufacturing in California provides the following output-related data:

Value added by Manufacture	\$15,054,319,000
Cost of Materials	\$8,477,272,000
Value of Shipments	\$23,376,973,000
Total Capital Expenditures	\$752,554,000

More recent value of shipments data is available from the Annual Survey of Manufactures. The ASM provides state level data at the three- and four-digit NAICS levels. Table V-7 lists the value of shipments for communications equipment manufacturing, as listed in the latest ASM.

**Table V-7. Value of Shipments Data for NAICS 3342,
Communications Equipment Manufacturing**

Year	Value of Shipments (\$1,000)
2000	39,095,895
1999	29,990,700
1998	19,633,103
1997	23,124,846

The Annual Survey of Manufactures can be found at the following website:
<http://www.census.gov/econ/overview/ma0300.html> .

BEA computes gross state product (GSP) down to the 2-digit SIC major group level. (The 2-digit groups are the aggregation of 3-digit industry groups.) Because of the importance of motor vehicles in the economy, SIC 37 is split into two components: SIC 371, motor vehicles, and SICs 372-379, other transportation equipment. In addition to total GSP, BEA also estimates the following components of GSP: employee compensation, indirect business taxes, and property-type income. BEA provides GSP data for the years 1977-2000 (the 2000 estimates were released in June 2002). GSP data can be accessed from the following U.S. Bureau of Economic Analysis Web site: <http://www.bea.doc.gov/bea/regional/gsp/>.

While the GSP data series does not provide the industry detail found in CBP, ES202, and other data series, it has one unique value. The sum of all the GSP industry group data equal the total output of the economy. This characteristic makes it possible to measure the share of total output represented by one or more industry groups. For example, California food and kindred products manufacturing totaled \$16.048 billion dollars in the year 2000. Since total gross state product was \$1,344.123 billion, food and kindred products represented 1.2 percent of the total output of the state economy.

Occupational Staffing Patterns

Staffing patterns represent the occupations employed within a particular industry group, or the industries that employ a particular occupation. The Labor Market Information Division of the California Employment Development Department maintains the following website link that matches statewide industry employment at the 3-digit SIC level to individual occupations: <http://www.calmis.ca.gov/file/IOMatrix/Staffing-Patterns1.htm>. As of mid-2002, the data are for the year 1998, with projected values for 2008.

Staffing pattern data are not available on a NAICS basis, so it is not possible to use NAICS 3342, (communications equipment manufacturing) as an example. However, as an approximation to the staffing patterns in this industry group, LMID provides data for the SIC 366, the communications equipment industry group.

The occupational staffing pattern estimates for 1998 list 66 different occupations in SIC 366. These occupations account for a total of 37,200 employees, or about 95 percent of total CES employment. Electrical and electronic assemblers and precision assemblers account for about 6,800 employees, or 17.3 percent of total employment. Engineers (electrical and electronic, computer, mechanical, industrial, and all others) account for about 5,700 employees, or 14.5 percent.

Foreign Trade

International markets are important for many California industries. It is often useful to investigate the international trade data for an industry that is being profiled. Not only will the data show recent levels of trade, but the various countries that are importing the products. Such information may help current and potential exporters target the best foreign markets for their products.

Export data are available from the U.S. Census Bureau at the 2-digit SIC level. The Bureau issues two principal data sets that provide merchandise export statistics for subnational areas. The Origin of Movement (OM) series is the most widely used and best-known series, and is commonly

known as the “MISER series”. The Massachusetts Institute for Social and Economic Research (MISER) has produced quarterly state export data since 1987 under an agreement with the Foreign Trade Division of the U.S. Census Bureau. The OM series uses “point of origin” data to try to allocate exports to states based on where the export journey began. The reliability of this allocation is fairly good with respect to manufactured exports, but less so with respect to exports of non-manufactured items. A key limitation is that the OM series cannot provide statistics for sub-state areas such as metropolitan areas.

A detailed explanation of the two Census Bureau data series can be found at <http://www.ita.doc.gov/td/industry/otea/state/technote.html>. For more information on MISER, see its foreign trade databases website at <http://www1.miser.umass.edu/trade/>).

The California Technology, Trade and Commerce Agency also provides MISER-based California exports by industry. (See http://commerce.ca.gov/ttca/pdfs/detail/int_trade/Q1.pdf.)

The Census Bureau’s Exporter Location (EL) series is a relatively new series (1993 onward), that is expected to offer more consistency and flexibility than the traditional OM series. The EL series assigns export values to sub-national areas, based on the physical location of exporters, as determined by ZIP codes reported on shipper export declarations forms. The EL series is expected to be well suited for export promotion purposes, where a key goal is to identify concentrations of international marketing activity.

The following links access state and metropolitan area export data from the EL series:

<http://www.ita.doc.gov/td/industry/otea/state/>
<http://www.ita.doc.gov/td/industry/otea/metro/>

Export data are not available for Communications Equipment Manufacturing (NAICS 3342). However, the EL series for SIC 36 (electronic and other electrical equipment and components, except computer equipment) shows that exports totaled \$3.23 billion in 2001, down from a high of \$3.94 billion in 2000.

Individual Company Information

For most industry profiles, it is useful to identify and discuss some of the individual companies in the industry. These may be some of the larger companies, or companies that are a significant factor in the industry, such as those that produce products and/or services that help to characterize the industry.

There are many sources of information on individual companies, including some privately held firms. However, unlike the industry data from state and federal agencies, many sources of company information do not categorize companies by NAICS or SIC code. Those few sources that use the codes may classify some individual firms differently. For example, it appears that Cisco Systems could always be assigned to the NAICS 334210 industry, since that industry includes data communications equipment such as bridges, routers and gateways. However, two different commercial business directories assigned the SIC 3577 code (computer peripheral equipment, not elsewhere classified) to the company. And the Cisco Systems 10-K report to the U.S. Securities and Exchange Commission for fiscal year 2000-01 lists the company SIC code as 3576, which is an obsolete code. (SIC 3576 was part of the 1972 SIC system, but was eliminated from the 1987

SIC system. The fact that Cisco was incorporated in 1984 may explain its initial and continued use of the SIC 3576 code.)

Some of the most comprehensive sources of information on individual companies are commercial business directories. Such directories are available both as printed publications, and as one or more databases on a CD-ROM. The CD-ROM databases allow for the creation of lists of companies based on parameters that can be specified, such as industry code, number of employees, etc. A list of companies can be extracted and then sorted by various criteria. Once the largest companies have been identified, they can be researched further via their Internet websites, and via Internet websites containing information on a variety of companies. (See <http://www.hoovers.com/> or <http://dir.yahoo.com/Business> as examples.)

Individual companies can also be researched through their securities filings with the U.S. Securities and Exchange Commission (SEC). EDGAR is the SEC's Electronic Data Gathering, Analysis, and Retrieval system, which is available on the Internet. The SEC requires all public companies (except foreign companies and companies with less than \$10 million in assets and 500 shareholders) to file reports and other forms electronically through EDGAR. Anyone can access and download this information for free. The Web link for EDGAR is <http://www.sec.gov/cgi-bin/srch-edgar>.

Most company annual reports have a distinct marketing orientation. As a result, the annual Form 10-K that must be filed with the SEC often proves to be a more useful source of financial and descriptive information about a company. The Form 10-K has a fixed format/structure to which all companies/registrants must adhere. (EDGAR contains 10-K reports and a wide variety of other SEC filings by companies.)

Industry Multipliers

Industry multipliers are valuable for showing the relationship of an industry to other industries, and to the overall economy. A multiplier shows the additional (or indirect) change to all other industries, as a result of each change in a selected industry. The multipliers are derived from input-output (IO) accounts that estimate the extent to which industries provide inputs and use outputs from each other in the overall economy.

Multipliers are produced by a number of organizations. One of the most widely used sources is the U.S. Department of Commerce, Bureau of Economic Analysis (BEA). The BEA develops and maintains the Regional Input-Output Modeling System (RIMS II). The System is based upon I-O tables derived from the BEA national I-O table and BEA regional economic accounts. RIMS II multipliers are available for 490 detailed industries and 38 industry aggregations. For more information about RIMS II, see <http://www.bea.doc.gov/bea/regional/rims/>.

To access the multiplier values for the 38 California industry aggregations, go to the CA Technology, Trade and Commerce website at <http://www.commerce.ca.gov>. Select California's Economy, then Economic Data in the first column. The multipliers link is under the Industry Employment and Related Information heading on the Economic data page.